



2006

Sustainable Florida Best Practices

Awards Summaries

**EDUCATIONAL
ALLIANCE**
for Sustainable Florida (EASF)



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Holloway Technology, Inc.

The concept has worked for centuries, but it took a little modern technology and the persistence of a retired ear, nose and throat doctor to make it into a revolutionary product.

Dr. Rufus M. Holloway and his company, Holloway Technology, are the driving forces behind the award-winning H.I.S. (Hybrid Irrigation System) that is taking the idea of irrigating plants with rainwater to a whole new level.

Dr. Holloway, a fifth-generation farmer, began experimenting with wading pools on his woody ornamental tree farm in Leesburg, Florida., as a way to cut labor costs in watering container-grown plants. He soon developed the H.I.S., an environmentally and economically sound irrigation system that is far less labor intensive and conserves water. The system is lined with an impermeable membrane that allows for rain harvesting and reuse. Water is collected over the entire acreage and stored in a lined reservoir. Every plant gets the same amount of water, and no water is wasted – every unused drop is directed back to the reservoir for future use.

By 2002, the project caught the attention of professionals from the University of Florida/IFAS and the Florida Department of Environmental Protection. The FDACS, local water management district and area growers also were eager to support the innovation. That year, Holloway's system won the Florida Department of Agriculture's Ag-Environmental Leadership Award for his contribution to the sustainability of agriculture in Florida.

This project is particularly important as the state population increases and water quantity and quality become increasingly significant. Irrigated agriculture faces in-

creased public pressure because the industry uses such a large percentage of available fresh water. The demand for alternative water sources led to Dr. Holloway's development of the H.I.S., a system that eliminates any aquifer withdrawal.

The savings are overwhelming; a 10-acre system will save up to 78 million gallons per acre, per year of fresh water, which allows a greater availability for human consumption. The Holloway initiative and technology will ensure the future of containerized agriculture in Florida because it addresses both concerns of water quantity by rain harvesting and reuse, and water quality by eliminating nutrient runoff or non-point source pollution.



The Holloway irrigation technology has been published in numerous Best Management Practice guides and is promoted as an alternative production strategy for similar climatic regions where rain is abundant. Because of the energy, water and labor savings associated with the H.I.S., the nursery industry will be able to sustain itself in the marketplace and from the ever-encroaching urban environment.

The system is truly a combination of ancient principle and high-tech wizardry as its use of sophisticated plastics, automation and energy-efficient equipment such as high volume, low pressure pumps and solar panels control water in one of the world's oldest forms of irrigation.

Holloway Technology is dedicated to improving the quality of life throughout the world, safeguarding our natural resources and providing water conservation leadership to the agriculture industries.

University of Florida

What started in the early 1990's as a dream to make environmental education and research and sustainable campus operations central goals at the University of Florida, came to fruition this year with the achievement of significant milestones, including the creation of an Office of Sustainability.

The campus-wide office, mandated to make UF a global leader in sustainability, is now managed by a full-time director and is funded by the president with a \$120,000 annual operating budget. In addition, a Faculty Fellow in Sustainability was instituted by the Provost, with \$50,000 in teaching and research seed grants to ensure that the university operates as a living laboratory for sustainability.

Finally, the University of Florida was designated as a "Certified Audubon Cooperative Sanctuary." UF is the first university to achieve this status and is one of just 607 such sanctuaries worldwide.

Leaders of the University of Florida's Office of Sustainability say that they have a special obligation to meet the challenges of sustainability for three interrelated reasons. First, they say that as educators, they play a leading role in training future scientific, social, political and cultural leaders, professionals and policy-makers. Second, they acknowledge that the university consumes significant resources and must reduce its ecological footprint. Third, they say that the students at the university will have a major environmental impact as consumers and conservers when they leave campus. To help address these issues, the university is planning a state-wide conference on National Campus Sustainability Day, October 25-26, 2006, to share their experience and help foster sustainable practices at other Florida institutions of higher learning.

The creation of the Office of Sustainability bears the

potential to redefine how the University of Florida does business – the message, values, knowledge and skills its faculty and staff impart to students and the impact it has as an institution upon the local, regional and state environment. As part of its mandate, the Office of Sustainability is charged with ensuring the economic viability of university operations that are altered or initiated for sustainability purposes.

The campus Master Plan, which details all construction and restoration efforts on campus, demonstrates a central commitment to environmental integrity and preservation. In addition, the ambitious "Zero Waste by 2015" goal will have a major positive impact on the environment and natural resource conservation. With 45,000 students,

thousands of faculty and staff, and a 2000 acre main campus, the University of Florida has a large ecological footprint. Reducing this footprint is among the goals of the Office of Sustainability.

The efforts toward sustainability were wholly self-initiated, the culmination of years of hard work by faculty, staff and students dedicated to greening the campus while increasing the knowledge and skills of sustainable practices among all stakeholders.

Objectives and responsibilities of the director of the Office of Sustainability include the initiation and coordination of opportunities to improve the sustainability of the university's physical operations, including energy and natural resource conservation, waste management, procurement, planning, design and construction, equitable access to healthcare, fair remuneration, and the promotion of a cultural climate that supports a balanced quality of life. The provost position focuses on stimulating the development of sustainability-related undergraduate and graduate courses and seminars.



Institute of Food and Agricultural Sciences/University of Florida

As everyone who works at a livestock operation – or lives near one – knows, manure management is an issue that demands attention. In fact, these operations are under increasing pressure to manage their wastes effectively and minimize environmental impacts.

In Florida, environmentally sound, sustainable practices are essential for staying in business, and that is why the University of Florida's Institute of Food and Agricultural Sciences is developing sustainable solutions to the manure management issues faced by Florida dairy farmers. Dr. Ann C. Wilkie, an associate research professor in the Soil and Water Science Department, has designed an innovative fixed-film anaerobic digester that treats flushed dairy manure and controls odors, allowing dairy farms to coexist peacefully with their neighbors.

The holistic manure management system also produces renewable energy (biogas) for on-farm use, minimizes environmental impact from waste emissions and maximizes fertilizer and water recovery for reuse. With initial funding provided by the Florida Energy Office, a full scale, fixed-film anaerobic digester is in full operation at the University of Florida's 500-cow Dairy Research Unit in Hague, Fl., serving as a demonstration model for the livestock industry in Florida and the nation. This technology provides a truly sustainable option for manure management that protects the environment and produces renewable energy. In addition to manure, anaerobic digestion technology can be used to treat a variety of wastewaters and produce renewable energy on a large scale.

Anaerobic digesters, which process waste under oxygen-free conditions, are different than conventional aerobic systems that use oxygen to treat waste. They can process

five to 10 times more waste than aerobic systems. And because the waste is enclosed to keep oxygen out, anaerobic digestion keeps odors in. Odors, flies and pathogens are reduced by as much as 95 percent.

As an added bonus, the methane produced can be used to heat water or generate electricity, eliminating greenhouse emissions that contribute to global warming. And, nutrients such as nitrogen and phosphorus can be recovered and used to fertilize crops.

Because manure from dairy and other types of livestock farms is so diluted with water, only two types of anaerobic digesters are practical in Florida – large, covered lagoons and the fixed-film digester. The digester is a 100,000-gallon tank with a small footprint that can process flushed manure in two to three days compared to 30 to 40 days for a lagoon.

After proving the concept in a laboratory, it had to be operated at a working dairy. At the Dairy Research Unit, the system is now generating biogas from manure flushed from animal barns and milking parlors,

and at about 40 cubic feet of methane per day that can be produced from the waste of each dairy cow, that is no small matter. The system is demonstrating that it can provide a sustainable solution for livestock manure management and facilitates voluntary compliance with environmental rules and regulations that are growing increasingly stricter.

Anaerobic digestion technology produces renewable energy and protects the environment – especially the neighbors.



Progress Energy/ Homosassa Springs Wildlife State Park

Florida Department of Environmental Protection

When Progress Energy decided to install and demonstrate environmentally friendly sustainable solar and hydrogen technologies, it chose of one Florida's most beloved parks in which to do it. The energy giant teamed up with the Florida Department of Environmental Protection and Stuart Energy Systems to test its sustainable hydrogen initiative at Homosassa Springs Wildlife State Park, a world-famous habitat for the endangered Florida manatee.

Progress Energy wanted to use the project to monitor and evaluate the energy, demand and environmental impacts of renewable energy, while conducting community outreach to educate the public on the benefits of sustainable energy.

The Sustainable Hydrogen Generator and Fuel Cell at Homosassa Springs Wildlife State Park requires only sunlight and water as fuel sources, making it sustainable and environmentally friendly. This innovative system consists of photovoltaic (PV) cells that convert sunlight into electricity. The electricity produced by the PV system is then used to power an electrolyzer that splits water into gaseous components – hydrogen and oxygen. The hydrogen gas is stored and then converted into electricity by the fuel cell during Progress Energy's peak demand periods.

The initiative's larger system is installed at the front entrance of the visitor center, while the smaller system is installed near the hydrogen fuel cell at the Wildlife Encounter Pavilion in the center of the park. The hydrogen fuel cell system is nestled between the Florida panthers and the pavilion – effectively blending environmental sustainable technology into the pristine park environment.

The initiative is so important because it addresses the challenges of developing viable energy alternatives for the future.

The electricity produced from the hydrogen fuel cell is used to supplement a portion of the electricity used at the park's Wildlife Encounter Pavilion, which exposes the program to the community through the park's educational programs, special camps and a number of its 300,000 annual visitors.

There are several reasons why Progress Energy is looking at hydrogen as a sustainable, clean fuel source for the future. Hydrogen is an abundant resource and can be extracted from water, natural gas, biomass and other fossil fuels. When hydrogen is made from renewable resources and used in a fuel cell to make electricity, the only emission into the atmosphere is harmless water vapor.



Florida, with its year-round sunny weather, provides a perfect opportunity for photovoltaics to be combined with electrolysis to produce hydrogen fuel. This project bridges the gap between these two technologies in an effort to develop a cost-effective, clean fuel that will produce environmentally friendly electric energy.

Because this project is about more than just the electricity it creates for the park, the entire system is equipped with a state-of-the-art data logger, which monitors, time stamps and records the energy production so that the results can be evaluated. And to assist with public education, a brochure titled *Harnessing Nature's Energy* is being utilized by the park and Progress Energy. There also is a project video for all who visit the park or the Progress Energy Web site.

Finally, Progress Energy is piloting "Hydrogen: The Power and the Potential" program, designed to motivate students to envision a world that utilizes a variety of energy sources, such as renewable energy, energy conservation and in particular, hydrogen.

Dr. Jennifer Languell

Dr. Jennifer Languell is committed to changing the world one building at a time. She began her quest along the coast of southwest Florida, but her message about the benefits of green building is spreading in every direction.

She is an educator, a consultant, an expert media resource and is founder of Trifecta Construction Solutions. She is possibly the state's most respected name in green building – and her work is trusted by industry leaders throughout the region.

“Within the state of Florida, Dr. Languell has proven to be a key leader, if not the foremost leader in educating the building industry and homebuyers about the benefits of green building,” said David Ellis, executive vice president of the Greater Atlanta Home Builders Association. “She is very aware of the concerns that a builder may have.”

Dr. Languell founded Trifecta Construction Solutions in 2003 to provide green building services that would help create healthy, efficient and sustainable construction projects.

Her personal commitments to education, research, healthy environments and a transformation of the building industry have formed the basis of Trifecta's initiatives to promote and implement green building and sustainable construction.

According to Dr. Languell, the implementation of environmentally responsible practices will result in valuable resource conservation. For example, encouraging the use of horizontal axis washing machines saves approximately 6,000 gallons of water, per year per washing machine. Through her various speaking engagements and seminars, Dr. Languell provides consumers tips on how to conserve energy, water and generally improve the health of their existing home.



Dr. Languell also serves as the director of the Florida Gulf Coast University WCI Green Building Demonstration and Learning Center, where she has established five programs to promote green building and sustainable development. These pro bono projects serve as example initiatives to encourage and educate local builders.

Projects included bringing in Lee County Works Skills students for a day of training on construction and green building. Another program was a “Healthy Interior” seminar at a local furniture store.

She also donates her time as a consultant on numerous projects, including the 2006 International Builder Show New American Home, the 2003 Gulfshore Business

Dream Home, Showcase homes for local Parade of Homes, and habitat for humanity homes – all to educate consumers on the benefits and practical applications of building green.

Dr. Languell's projects provide solutions that easily can be implemented by the construction industry to reduce builders'

use of natural resources, while providing homeowners with a healthy and efficient home that can even create vital wildlife habitats. She points out that an often missed, but important, part of green building is the ongoing affordability of the homes. In addition to potentially qualifying for energy-efficient mortgages, homeowners experience lower operating costs due to reduced energy and water bills.

From educating students and young workers to challenging the building industry to build smarter, Dr. Jennifer Languell's leadership in sustainable building practices is making a difference.

Harmony

Winning awards is nothing new for the community of Harmony, located in Osceola County, just south of Orlando. It has won first place in the Parade of Homes, was awarded the 18th Residential Environmental Award from the Florida Association of Realtors® and was recognized by the Council for Sustainable Florida as a Promising Practice in 2004.

But a recent study by the University of Florida convinced community leaders that they needed to do more to make a long-term impact in the area. “Green design is not enough in new communities,” the report said. Though the new project’s design was expected to foster an increased environmental awareness, the study found that resident knowledge of environmental issues was about the same or even less, except for topics where specific educational activities had occurred. Without community education, the environmental benefits of green design could dwindle over time.

The community of Harmony decided to address this need in two important ways. First, they promoted natural resource protection through measures such as prohibiting private development on either of two 500-acre natural lakes; they committed to retaining 70 percent of the community’s 11,000 acres as open space; they continued full shielding of outdoor lighting to control light pollution; all homes meet Energy Star standards; and they promoted walking, alternative transportation and on-site capture of trips.

Secondly, to promote an environmental ethic among its residents, Harmony expanded its normal architectural covenants by adding a series of innovative rules that guide resident interaction with wildlife, habitat and companion animals. Further, the Harmony Conservation staff and the non-profit Harmony Institute created programs to encour-

age resident involvement with habitat management, trail development, data gathering and wildlife appreciation that goes beyond the green design base and promotes long-term sustainability.

Harmony represents itself as an “environmentally intelligent” community, meaning many of the measures taken do not cost more to implement but do require some forethought to determine whether improved practices can achieve the needed results. To that end, a set of restrictions, guidelines and goals were developed through the Harmony Institute to provide sustainable practices that individual homeowners can take and, in some cases, are required to take in managing their home sites. To help with implementation, a resident committee of the Harmony Homeowners Association meets regularly to review the success of practices and to educate residents in their application.

In the belief that the future of environmental awareness rests in youth education, Harmony and the Harmony Institute supported the establishment of a charter elementary school on the property. Curriculum has been created that helps foster a compassionate world view toward animals and nature among students. A veterinary aide program has already been established at Harmony High School that focuses on animal care. It currently has 117 students enrolled.

In other efforts to promote sustainability and educate homeowners in a fun and creative way, Harmony celebrates an annual Dark Sky festival that calls attention to the importance of a dark sky as a natural resource. There also is a resident conservation club that has taken on projects as diverse as pulling invasive cattails from wetlands to conducting annual bird counts and organizing monthly hikes and field trips.

